REMARKS

The Office Action dated February 25, 2003 has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto. By this Amendment, claim 7 has been amended to correct minor grammatical errors. No new matter has been added or amendments made that narrow the scope of any elements of any claims. The claim changes are merely cosmetic in nature. Accordingly, claims 1-7 are pending in this application and are submitted for consideration.

Applicants acknowledge and thank the Examiner for indicating that claims 2, 3 and 5 would be allowable over the prior art if amended to be in independent form. However, Applicants respectfully submit that all of the presently pending claims recite allowable subject matter and therefore, placing claims 2, 3 and 5 into independent form is not necessary.

Entry of this Amendment is proper under 37 C.F.R. § 1.116 since this Amendment: (a) places the application in condition for allowance for reasons discussed herein; (b) does not raise any new issue regarding further search and/or consideration since the Amendment amplifies issues previously discussed throughout prosecution; (c) does not present any additional claims without canceling a corresponding number of finally-rejected claims and (d) places the application in better form for appeal, should an appeal be necessary. The Amendment is necessary because it is made in reply to arguments raised in the rejection. Entry of the Amendment is thus respectfully requested.

Claim 7 was objected to for minor grammatical errors. By this amendment claim 7 has been amended. Therefore, the objection is requested to be withdrawn.

Claims 1, 4 and 6 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Yamamoto et al. (U.S. Patent No. 5,647,206, "Yamamoto") in view of Tanaka et al. (U.S. Patent No. 5,956,947, "Tanaka"). The Office Action took the position that Yamamoto discloses all the elements of the claimed invention, with the exception of disclosing that the control device further switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed. However, Applicants submit that claims 1, 4, 6 and 7 recite subject matter that is neither disclosed nor suggested by any combination of the prior art.

Claim 1 recites an exhaust emission control system of an internal combustion engine for cleaning exhaust gases discharged from the internal combustion engine including an exhaust system defining a main exhaust passage connected to an internal combustion engine, and a bypass exhaust passage which branches off and joins back to the main exhaust passage. A switching device switching an exhaust gas flow path to either of the main exhaust passage and the bypass exhaust passage. An adsorbent material disposed within the main exhaust passage for adsorbing unburned constituents of exhaust gases introduced into the main exhaust passage and releasing the unburned constituents as temperature increases. A control device operable to control the switching device. The control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material absorbs the unburned constituents, the control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburned constituents is released from the adsorbent material, and

the control device switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed.

In making this rejection, the Office Action took the position that the combination of Yamamoto and Tanaka discloses all of the elements of the claimed invention. However, it is respectfully submitted that the prior art fails to disclose or suggest the structure of the claimed invention, and therefore, fails to provide the advantages of the present invention. For example, in the exhaust emission control system of the present invention, the control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material adsorbs the unburned constituents, the control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburned constituents is released from the adsorbent material, and the control device switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed.

As a result of the claimed configuration, the exhaust gas flow path is switched to the main exhaust passage all the time, except while the unburned constituents are allowed to be released from the adsorbent material, i.e., almost all the time while the internal combustion engine is in operation, so that the exhaust gases are allowed to flow through the main exhaust passage. Even if deposits such as soot are deposited in the adsorbent material when the exhaust gases pass through the adsorbent material, the adsorbent material is put in a highly heated state by the highly heated exhaust gases which flows through the main exhaust passage, and the deposits are burned with oxygen left unused in the exhaust gases due to fuel cuts taking place while the internal combustion engine is in operation, whereby the deposits can be removed from the

adsorbent material. In addition, the frequency at which the switching device performs the switching operation can remarkably be reduced by allowing the switching device to switch the exhaust gas flow path only when the unburned constituents are allowed to be released from the adsorbent material. As a result, the durability of the system can be improved.

Yamamoto discloses an exhaust emission purification apparatus. As shown in Fig. 1, the adsorption device 5 includes a passage 5a provided with a honeycomb body 12 and a bypass passage 5b containing a flow of exhaust gas which does not pass through honeycomb 12. A switching valve 8 switches and selects the passage 5a or bypass passage 5b. When the switching valve 8 is operated in the valve-open position, the exhaust gas flow passes through passage 5a and flows through the honeycomb body 12 carrying adsorbent composed of hydrophobic zeolite, and HC is adsorbed by the adsorbent. As a result, exhaust gas after HC has been eliminated is released from exhaust pipe 7 to the atmosphere.

As the engine warms up, the exhaust gas temperature rises. After a predetermined time ta passes, the HC-adsorbable temperature of the adsorbent and the separation speed of the adsorbent become equalized in a temperature at which separation of the HC is reached, switching valve 8 assumes a valve-closed position. Consequently, the exhaust gas flows through the bypass passage 5b and the exhaust gas containing no HC passes through the bypass passage 5b and is released into the atmosphere.

The Office Action took the position that Yamamoto discloses that the control device switches the exhaust gas flow path to the bypass exhaust passage only when

the adsorbed unburnt constituents are released from the adsorbent material. The Office Action refers to step S5, and line 63 of col. 5 to line 12 of col. 6 in support of this position. Thus, upon review of Yamamoto, the predetermined time ta is a time of starting the release of the unburned constituents. When a predetermined time ta + tb has passed, it is determined that the release from the adsorbent material is completed, then the processing is finished.

Therefore, Yamamoto fails to disclose or suggest that the control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburnt constituent is released from the material, or that the control device then switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburnt constituent is completed. As a matter of fact, the Office Action admits that Yamamoto fails to disclose that the control device further switches the exhaust gas flow path to the main exhaust path when a release of the adsorbed unburnt constituents is completed.

Tanaka discloses an exhaust gas purifying apparatus and method internal combustion engines where the gas passes through the adsorbent material passage only in a predetermined condition after the release from the adsorbent material. As shown in Fig. 1, two exhaust pipes 2a and 2b are connected to engine 1 and are emerged into a single pipe. The exhaust pipes 2a and 2b are again separated into two exhaust pipes 8a and 8b. Each of the exhaust pipes 8a and 8b is connected to a muffler 9a and 9b located on the rear side of the chassis. Catalysts 3a and 3b are provided in the two exhaust pipes 2a and 2b, respectively. An adsorbent sleeve 4 is provided at a portion in which the exhaust pipes 2a and 2b are merged into one downstream of the catalysts 3a

and 3b. The interior of the adsorbent sleeve 4 is divided into two flow paths A and B, and the adsorbent for adsorbing hydrocarbon (HC) is provided in one of the flow paths. A zeolite system adsorbent 42 is provided in flow path A for adsorbing the hydrocarbon HC contained in the exhaust gas.

A bypass valve 40 selectively opens or closes the flow path A and the flow path B and is mounted in the outlet portion C of the adsorbent sleeve 4. The bypass valve 40 is connected through a lever 43 and a diaphragm chamber 41 mounted outside the adsorbent sleeve 4. The lever 43 rotates about a fulcrum 44. When the end of the lever 43 on the side of the diaphragm chamber 41 is lowered, the bypass valve 40 is lifted by the end portion of the lever 43 on the side of the bypass valve 40. This results in the flow path B being opened and the flow path A being closed. However, when the end of the lever 43 on the side of the diaphragm chamber 41 is lifted, the bypass valve 40 is lowered by the end portion of the lever 43 on the bypass valve 40. This results in the flow path A being open and the flow path B being closed.

The Office Action took the position that Tanaka discloses that the control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material adsorbs the unburned constituents in steps 402 through 406 and lines 28-37 of column 8, and Fig. 4 and 5. The Office Action further took the position that Tanaka discloses that the control device switches the exhaust gas flow path to the bypass exhaust passage when the unburned constituents are released from the adsorbent material at steps 404, 409 through 412, line 38 of column 8 to line 16 of column 9 and Fig. 6. The Office Action also took the position that Tanaka discloses that the control device switches the exhaust gas flow path to the main exhaust passage when a release

of the adsorbed unburned constituents is completed at steps 406, 412 through 414, and lines 17-52 of column 9.

However, in Tanaka, when the adsorbent material adsorbs, a gas flows through the gas flow path A (adsorbent side). When adsorbed material is released, most of the gas flows through the gas flow path B (bypass side). Further, when a fuel is cut off after the release of the adsorbed material, or when a gas being in lean condition, a gas flows through the gas flow path A (bypass side). See col. 8, line 28 - col. 9, line 52.

Contrary to this, in the present invention, the control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburned constituents is released from the adsorbent material, as recited in claim 1. Furthermore, the control device switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburnt constituents is completed, as also recited in claim 1. As a result of this, in the present invention, deposits such as soot can be burned and removed from the adsorbent material. Furthermore, the frequency at which the switching device switches the exhaust gas flow path to either of the main exhaust passage and the bypass exhaust passage is reduced, thereby increasing the reliability of the switching device and improving the durability of the exhaust control system.

Still further, although the Office Action asserted that it would have been obvious to one having ordinary skill in the art to modify Yamamoto by the teachings of Tanaka in order to provide an effective way to remove soot adhered to the adsorbent, we are of the opinion that the Examiner is exercising impermissible hindsight. In Yamamoto, the object is to promptly release HC from the adsorbent material. (See column 2, lines 41-54). Yamamota does not disclose that residual soot adhered to the adsorbent material

is removed. But in Tanaka, the object is to remove residual soot, as discussed at column 2, lines 10-14. Therefore, there is no suggestion or motivation in Tanaka as to why one would modify Yamamoto in the manner suggested.

Therefore, as discussed above, the combination of Yamamoto and Tanaka fails to disclose an exhaust emission control system wherein the control device switches the exhaust gas flow path to the main exhaust passage when the adsorbent material adsorbs the unburned constituents, the control device switches the exhaust gas flow path to the bypass exhaust passage only when the adsorbed unburned constituents are released from the adsorbent material, and the control device switches the exhaust gas flow path to the main exhaust passage when a release of the adsorbed unburned constituents is completed, as recited in claim 1.

Thus, it is respectfully submitted that the Applicants' invention, as set forth in claims 1, 4, 6 and 7, is not obvious within the meaning of 35 U.S.C. § 103.

As claims 4, 6 and 7 depend directly or indirectly from claim 1, Applicants respectfully submit that each of these claims incorporate the patentable aspects thereof, and are therefore allowable for at least same reasons as discussed above.

In view of the foregoing, reconsideration of the application, withdrawal of the outstanding rejections, allowance of claims 1, 4, 6 and 7 (claims 2, 3 and 5 already being indicated as reciting allowable subject matter), and the prompt issuance of a Notice of Allowability are respectfully solicited.

If this application is not in condition for allowance, the Examiner is requested to contact the undersigned at the telephone listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing docket number 107355-00052.**

Respectfully submitted,

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